

having hydrophilic properties and joining the materials together to form a garment for performance requirements or athletic application.

[0020] By implementing an embodiment of the present invention where a hydrophobic layer of fabric is inserted between the hydrophilic layer and the wearer's skin, the risk of moisture absorbing through the garment and coming into contact with the wearer's skin is almost completely eliminated. Further, the strategic integration of hydrophilic fabric into or on certain sections of a garment in accordance with embodiments of the present invention, allows the wearer to keep parts of their body moisture-free.

[0021] FIG. 1 generally illustrates a layered structure of one embodiment of the present invention where an outer moisture absorbing (i.e., hydrophilic) layer **10** is positioned over an inner moisture wicking (i.e., hydrophobic) layer **12**. The moisture absorbing layer **10** absorbs moisture **14** thereby providing a dry surface area upon which the wearer may wipe moisture from their extremities. The moisture wicking layer **12** wicks moisture away **16** from the wearer's body, keeping the wearer dry and cool.

[0022] In FIG. 1, the moisture absorbing layer **10** is shown as an outer layer positioned over the inner moisture wicking layer **12**. However, in other embodiments of the present invention, it may be advantageous to position the moisture wicking layer over the moisture absorbing layer. In still other embodiments, the moisture absorbing fabric and the moisture wicking fabric can be integrated into a single layer garment.

[0023] In certain embodiments, the present invention may have additional layers added on or between layers **10** and **12** to accommodate performance. Exemplary third layers include, but are not limited to hydrophilic material, hydrophobic material, waterproof material, breathable material, nonwoven material, foam, nonwoven and foam composite, spacer fabric, elastomeric composite, membrane, film or exterior shell fabric, depending on the performance requirements or athletic application.

[0024] The placement of each fabric type (wicking vs. absorbing) on or within an individual garment may be varied based upon the specific sport and/or activity in which the wearer is participating in order to effectively manage perspiration and maximize athletic performance.

[0025] FIG. 2 depicts an embodiment of the present invention used in a shirt. As shown in FIG. 2, hydrophilic fabric patches **20** are positioned across the shoulders of a shirt formed of hydrophobic material **22** to facilitate the absorption of moisture, in particular, from the face and hands of the wearer. The hydrophobic material **22** forming the shirt wicks moisture away from the shirt wearer's body.

[0026] FIG. 3 depicts an embodiment of the present invention used in a pair of shorts, where hydrophilic fabric **30** is positioned at the hips, legs and lower back overlying the garment body formed of hydrophobic material **32**. The hydrophobic material **32** wicks moisture away from the wearer's body while the strategically positioned hydrophilic fabric **30** provides surface area upon which the wearer may wipe moisture from their extremities.

[0027] FIG. 4 depicts an embodiment used in a compression sleeve. As shown in FIG. 4, a hydrophilic band **40** is positioned around the wrist for absorbing moisture from the wearer's face and hands. The sleeve **42** is formed of hydrophobic material, which serves to wick moisture away from the length of the wearer's arm.

[0028] The joining together of the moisture wicking material and the moisture absorbing material may be varied based performance requirements or athletic application. In accordance with various embodiments of the invention, the hydrophilic layer and the hydrophobic layer are joined to each other. In some embodiments, the hydrophilic and hydrophobic fabrics paired together in the same garment are joined at one or more seams where each fabric has been cut according to a specific pattern used in making the garment. In other embodiments, such as where a hydrophilic fabric patch or panel is placed directly on top of a continuous piece of hydrophobic fabric, the fabrics may not be joined at a seam. Rather, in some embodiments, the hydrophilic patch or panel may be joined directly on top of the hydrophobic fabric. In certain embodiments, the entire portion of one side of the hydrophilic patch or panel may be joined to the hydrophobic fabric, while in other embodiments, only a portion of the hydrophilic patch or panel may be joined to the hydrophobic fabric. In other embodiments, the hydrophilic and hydrophobic fabrics are joined both at a seam and directly together.

[0029] In certain embodiments, the fabrics are mechanically joined (e.g., sewn or stitched together). A variety of stitch methods (e.g., flatlock, surge, double seam) may be utilized based on the method best suited to pair the specific fabrics and the intended use of the garment.

[0030] Alternatively, adhesive may be used to join the hydrophilic fabric to the hydrophobic fabric. In these embodiments, the type of adhesive utilized must be compatible with the overall garment construction as well as the garment's care instructions. Exemplary adhesives that may be used in this process include, but are not limited to the DESMOCOLL®, DESMOMELT®, DISPERCOLL®, DESMODUR® and BAYHYDUR® product lines from Bayer MaterialScience AG, a variety of seam sealing tapes and heat transfer adhesives that allow for the permanent bonding of two fabrics without the use of any stitching. The bonding is instead effectuated using, for example, heat, lamination or sonic pressure.

[0031] Additional methods of bonding the hydrophilic layer and the hydrophobic layer include welding or a combination of any of the bonding techniques referenced herein. In certain embodiments, the use of an adhesive is paired with sewing the hydrophilic panel to the hydrophobic fabric.

[0032] The moisture absorbing and moisture wicking layered system embodied in the present invention has been optimized so that when the layers are bonded together or otherwise paired, the garment fits the wearer properly and maintains that fit after multiple washings/laundings. This is an especially challenging process in light of the varying properties and behavior of most hydrophobic vs. hydrophilic fabrics.

[0033] When two different fabrics are joined or combined together in one garment, it is critical that the fabrics paired together are compatible. Further, once it is determined that the fabrics are compatible, the fabrics need to be combined together in a way so as to maximize effectiveness and durability. To ensure quality and durability, the following characteristics have been addressed in various embodiments of the present invention:

Shrinkage Levels

[0034] Different fabrics shrink in distinct ways and in distinct proportions when they are washed. Typically, fabric